

E42 p47se SPB

2001-07-05

CLAIMS

- 5     1.    An oscillator circuit comprising a first LC-oscillator and a second LC-oscillator, the first LC-oscillator comprising a resonance inductor, the second LC-oscillator comprising a resonance inductor, the first LC-oscillator and the second LC-oscillator having substantially the same fundamental frequencies, **characterized in that** the resonance inductor of the first LC-oscillator is  
10    coupled by mutual inductance to the resonance inductor of the second LC-oscillator, to thereby enable the first LC-oscillator and the second LC-oscillator to frequency lock to each other.
- 15     2.    The oscillator circuit according to claim 1, **characterized in that** the oscillator circuit comprises a third LC-oscillator, the third LC-oscillator comprising a resonance inductor, and in that the resonance inductor of the third LC-oscillator is coupled by mutual inductance to at least one of the other resonance inductors of the other LC-oscillators.
- 20     3.    The oscillator circuit according to claim 2, **characterized in that** the oscillator circuit comprises a fourth LC-oscillator, the fourth LC-oscillator comprising a resonance inductor, and in that the resonance inductor of the fourth LC-oscillator is coupled by mutual inductance to at least one of the other resonance inductors of the other LC-oscillators.
- 25     4.    The oscillator circuit according to claim 1, **characterized in that** the oscillator circuit comprises an arbitrary number of further LC-oscillators, each further LC-oscillator comprising a resonance inductor, and in that each of the resonance inductors of the further LC-oscillators is coupled by mutual  
30    inductance to at least one of the other resonance inductors of the other LC-oscillators.

5. The oscillator circuit according to any one of claims 1 to 4, **characterized in that** the mutual inductance coupling between the resonance inductors of the LC-oscillators is achieved by at least partly intertwining the inductor windings of the respective resonance inductors  
5 which are inductively coupled by mutual inductance.

6. The oscillator circuit according to any one of claims 1 to 5, **characterized in that** the LC-oscillators have substantially identical circuitry.

10 7. The oscillator circuit according to any one of claims 1 to 6, **characterized in that** a fundamental frequency of the LC-oscillators is substantially a same frequency for all of the LC-oscillators.

8. The oscillator circuit according to any one of claims 1 to 7,  
15 **characterized in that** the LC-oscillators are differential LC-oscillators, where each differential LC-oscillator comprises at least one fundamental frequency AC-ground due to the differential symmetry.

9. An oscillator arrangement comprising a first oscillator circuit and a  
20 second oscillator circuit, each oscillator circuit being according to claim 8, **characterized in that** the oscillator arrangement comprises a first AC coupling between one of the at least one fundamental frequency AC-ground points of the first oscillator circuit and one of the at least one fundamental frequency AC-ground points of the second oscillator circuit, thus locking the  
25 first oscillator circuit to the second oscillator circuit.

10. The oscillator arrangement according to claim 9, **characterized in that** the first oscillator circuit and the second oscillator circuit are substantially identical.

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11. The oscillator arrangement according to claim 10, **characterized in that** the first AC coupling is between a first fundamental frequency AC-

ground point of the first oscillator circuit and a first fundamental frequency AC-ground point of the second oscillator circuit, the first fundamental frequency AC-ground points being identical fundamental frequency AC-ground points.

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12. The oscillator arrangement according to claim 11, **characterized in that** the oscillator arrangement comprises a second AC coupling between a second fundamental frequency AC-ground point of the first oscillator circuit and a second fundamental frequency AC-ground point of the second oscillator circuit, the second fundamental frequency AC-ground points being identical fundamental frequency AC-ground points.

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13. The oscillator arrangement according to any one of claims 9 to 11, **characterized in that** the oscillator arrangement comprises a third oscillator circuit according to claim 8.

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14. The oscillator arrangement according to claim 13, **characterized in that** the first AC coupling is further AC coupled to a first fundamental frequency AC-ground point of the third oscillator circuit.

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15. The oscillator arrangement according to claim 13, **characterized in that** the oscillator circuit comprises a second AC coupling between a second fundamental frequency AC-ground point of the first oscillator circuit and a second fundamental frequency AC-ground point of the third oscillator circuit, the second fundamental frequency AC-ground points being identical fundamental frequency AC-ground points and separate from the first fundamental frequency AC-ground points.

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16. The oscillator arrangement according to any one of claims 13 to 15, **characterized in that** the third oscillator circuit has substantially a same fundamental frequency as the first and second oscillator circuits.

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17. The oscillator arrangement according to any one of claims 13 to 15, **characterized in that** the third oscillator circuit has a fundamental frequency which is substantially twice the frequency as the fundamental frequencies of the first and second oscillator circuits.

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18. The oscillator arrangement according to any one of claims 13 to 17, **characterized in that** the oscillator arrangement comprises a fourth oscillator circuit according to claim 8.

10 19. The oscillator arrangement according to claim 18, **characterized in that** the first AC coupling is further AC coupled to a first fundamental frequency AC-ground point of the fourth oscillator circuit.

15 20. The oscillator arrangement according to claim 18, **characterized in that** the oscillator arrangement further comprises a third AC coupling between a fundamental frequency AC-ground point of the second oscillator circuit being separate from the first fundamental frequency AC-ground point of the second oscillator circuit and a corresponding fundamental frequency AC-ground point of the fourth differential oscillator.

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21. The oscillator arrangement according to any one of claims 18 to 20, **characterized in that** the fourth oscillator circuit having a fundamental frequency which is substantially the frequency of the fundamental frequency of the first and second oscillator circuit.

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22. The oscillator arrangement according to any one of claims 18 to 20, **characterized in that** the fourth oscillator circuit having a fundamental frequency which is substantially twice the frequency of the fundamental frequency of the first and the second oscillator circuit.

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23. The oscillator arrangement according to any one of claims 18 to 20, **characterized in that** the fourth oscillator circuit having a fundamental

frequency which is substantially twice the frequency of the fundamental frequency of the third oscillator circuit.

24. The oscillator arrangement according to any one of claims 9 to 23,  
5 **characterized in that** one AC coupling between two fundamental frequency AC-ground points, is further coupled to a voltage source via an AC-impedance element.

25. The oscillator arrangement according to any one of claims 9 to 23,  
10 **characterized in that** one AC coupling between two fundamental frequency AC-ground points, is further coupled to ground via an AC-impedance element.

26. The oscillator arrangement according to any one of claims 9 to 25,  
15 **characterized in that** one AC coupling between two fundamental frequency AC-ground points is a direct coupling.

27. The oscillator arrangement according to any one of claims 9 to 25,  
20 **characterized in that** one AC coupling between two fundamental frequency AC-ground points is a resistive coupling.

28. The oscillator arrangement according to any one of claims 9 to 25,  
**characterized in that** one AC coupling between two fundamental frequency AC-ground points is a capacitive coupling.

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29. An oscillator arrangement comprising an arbitrary number of oscillator circuits, each oscillator circuit being according to claim 8, **characterized in that** the oscillator arrangement comprises an arbitrary number of AC couplings between fundamental frequency AC-ground points of the oscillator  
30 circuits, thus frequency locking the oscillator circuits.

30. A communication unit, **characterized in that** the communication unit comprises an oscillator circuit according to any one of claims 1 to 8.

5 31. A communication unit, **characterized in that** the communication unit comprises an oscillator arrangement according to any one of claims 9 to 28.

10 32. A method of frequency locking a first LC-oscillator to a second LC-oscillator, **characterized in that** the method comprises coupling by mutual inductance a resonance inductor of the first LC-oscillator with a resonance inductor of the second LC-oscillator.